Indices Extensions

Do now:

[Senior Kangaroo 2019 Q12] What is the value of $A^2 + B^3 + C^5$, given that:

$A = \sqrt[3]{16\sqrt{2}}$

$B = \sqrt{9\sqrt[3]{9}}$

$C = \left[\left(\sqrt[5]{2}\right)^2\right]^2$

1

$2^3 + 2^3 + 3^4 + 3^4 + 3^4 = ?$

- $2^3 + 3^4$
- 4^5
- $2^4 + 3^5$
- $2^6 + 3^{12}$

2

$\sqrt{9^{16x^2}}$

- 9^{4x}
- 9^{8x^2}
- 3^{4x}
- 3^{8x^2}

3

$\frac{6^{2007} - 6^{2006}}{30} = ?$

HOW CAN WE MAKE THESE BOTH TO HE POWER OF 2006?

- 30
- 0.2
- 6^{2005}
- 6^{2007}
- 36

4

$$27^{-\frac{x}{3}}+81^{\frac{1-x}{4}}$$

If the expression above can be stated in the form of $\frac{a}{b^x}$ for positive integers a and b, what is the value of $a+b$?

5

$$\begin{cases} ab = a^b \\ \frac{a}{b} = a^{3b} \end{cases}$$

a and b are real numbers, such that $a > 1$ and $b \neq 0$, satisfying the above system.

Find b^{-a}.

6

Let $x = 5^a$ and $y = 5^b$. Suppose that:

$$xy = 125$$

$$5x^2y = 1$$

7

[Kangaroo Pink 2018 Q16] In the calculation shown, how many times does the term 2018^2 appear inside the square root to make the calculation correct?

$$\sqrt{2018^2 + 2018^2 + \ldots + 2018^2} = 2018^{10}$$

8

Simplify:

$$\frac{(3x^2y^3)^3 \times (2x^4y^{-2})^4}{8\sqrt[4]{16x^{12}y^8}}$$